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t_vector = 0:.01:pi;
amp_vector = 1:10;
num_rows = 500;

N = size(t_vector,2)

for i = 1 : num_rows

    index = randi(10);
    dataset(i,1:N) = sin(t_vector)*amp_vector(index); %generates a curve with a given
amplitude
    dataset(i,N+1) = amp_vector(index); %stores the amplitude as a classifier

endfor

noise_factor = 5; %sets the maximum noise;
noisy_dataset = dataset(:,1:N) + noise_factor*rand(num_rows,N); %adds noise
noisy_dataset(:,N+1) = dataset(:,N+1); %copies classifiers

%generates training / testing datasets
training_percentage = .85;
num_training_rows = floor(.85*num_rows);
training_rows = randperm(num_rows,num_training_rows);
training_dataset = noisy_dataset(training_rows,:);

testing_dataset = noisy_dataset;
testing_dataset(training_rows,:) = [];

training_file = "/users/charlesdavi/Desktop/amp_training.txt";
testing_file = "/users/charlesdavi/Desktop/amp_testing.txt";

csvwrite(training_file,training_dataset);
csvwrite(testing_file,testing_dataset);

```